

**The California  
CABG Outcomes  
Reporting  
Program  
(CCORP)**

**Hospital  
Abstractor  
Training**

**Good Samaritan  
Hospital, Los Angeles**

**March 18, 2006**

**Today's Agenda**

- CCORP Update
- Data Definitions
- Practice Vignettes
- Questions and Answers
- Quiz

## **The Office of Statewide Health Planning and Development (OSHDP)**

- Facilities Development
  - Seismic safety
  - Code compliance
- Cal-Mortgage
  - Facility financing
- Workforce and Community Development
  - Health professions training
  - Nursing initiative
- Healthcare information
  - Inpatient, ED and ASC
  - PDD, utilization, financial
- Healthcare Quality and Analysis
  - Healthcare Outcomes Center
  - Data dissemination

## **CCORP Staff and Consultants**

- Joseph Parker, Ph.D., Director, Healthcare Outcomes Center
- Holly Hoegh, Ph. D., Manager, Clinical Data Programs
- Hilva Chan, Program Manager
- Herb Jew, Statistician
- Denise King, Data Manager
- Niya Fong, Program Support
- Anthony Steimle, M.D., Consulting Cardiologist
- Zhongmin Li, Ph.D., Health Services Research, UC Davis
- Geeta Mahendra, Senior Analyst, UC Davis

## **CCORP Background**

- In 2001, Senate Bill 680 was passed and mandated reporting of CABG surgery quality ratings for hospitals every year and every other year for surgeons.
- Other features of the law:
  - 9-member clinical advisory panel (inc. 4 surgeons)
  - Process for surgeon review and 'appeal' of final ratings
  - Limits on number/type of data elements collected
  - Requirement to evaluate the program's impact

## **CCORP Progress**

- Three years of data collection nearly complete
- Five meetings of the CAP have been held
  - Next scheduled for April 25
- Medical records review of 2003 data (15 hospitals) completed and 2004 data (40 hospitals) underway
- 2003 hospital results distributed for hospital review in September 2005 and public report forthcoming
- 2003-04 combined surgeon results to be distributed late Summer 2006 with public report coming late 2006

## **Purpose of the Training**

- Inform hospitals of changes made to CCORP effective with data beginning January 2006
- Clarify data element definitions to improve coding of CCORP risk factors
- Provide resources to assist hospitals with future data abstraction questions

## **Changes to 2006 Data Submission Process (1)**

- Effective data year 2006
- Mandatory\* data submission testing for hospitals when:
  - CCORP data requirements or format specifications change
  - Data collection tool is modified by STS vendor or is different from one used in prior period
  - Hospital using an STS approved software changes to a different vendor
- Eliminate the three extension filing limits on hospitals per report period.

\* Hospitals using OSHPD CCORP tool don't have to test

## **Changes to 2006 Data Submission Process (2)**

- Additional data acceptance criteria:
  - Responsible surgeon name and license number must match name and license number in the California Medical Board licensing database.
  - Following data elements must contain a valid value
    - Facility ID
    - Medical record number
    - Responsible surgeon name
    - Responsible surgeon California license number
    - Isolated CABG
    - Date of Surgery
    - Date of Discharge
    - Discharge Status
    - **Gender**
    - **Status of the Procedure**
    - **Dialysis**
    - **Prior PCI**

## **Additions to 2006 Data Elements (1)**

- Purpose to develop outcome measures beyond mortality as additional quality indicators
- Complications (7):
  - Reop - Bleed Tamponade
  - Reop - Graft Occlusion
  - Deep Sternal Wound Infection
  - Postoperative Stroke > 72 hours
  - Continuous Coma >= 24 hours
  - Prolonged Ventilation
  - Postoperative Renal Failure

## **Additions to 2006 Data Elements (2)**

- Two Risk Factors:
  - Resuscitation
  - Previous CABG
- Improve Data Quality
  - Ejection Fraction Done
- Process Measure
  - Radial Artery Used

## **Changes and Deletions to Data Elements**

To align more closely with new STS data element definitions and changes:

- Classification CCS and Primary Incision **deleted**
- No. of Prior Card Ops w/Bypass and No. of Prior Card Ops w/o Bypass - **replaced** by “Incidence”
- CPB Used and Conversion to CPB - **replaced** by “CPB Utilization” and “CPB Utilization - Combination”

**CCORP v.2.0**  
**Required Data Elements (59)**

- Identification and classification (10)
- Demographic risk factors (5)
- Operative risk factor (1)
- Comorbidities (21)
- Previous Interventions (4)
- Hemodynamic status (6)
- Process of care (5)
- Complications (7)

**CCORP Ongoing Work**

- Development of a Cardiac Online Reporting system for hospital data submission/correction (2007 or 2008)
- Speeding up program timelines to improve timeliness of public reports (e.g., consolidation of data quality reports)
- Evaluate the impact of CCORP on heart bypass outcomes in California

## **Anthony Steimle, MD**

- Director of the Regional Heart Failure Program for Kaiser Permanente Northern California
- Graduated from UCSF School of Medicine and trained in Internal Medicine, Cardiology, and Heart Failure at UCLA
- Was a UCLA Robert Wood Johnson Clinical Scholar
- Recognized as one of the "Outstanding Physicians of the Year" at UCLA
- Has been involved in training and consulting for both the voluntary and mandatory CABG programs since 1995

## **Patient Identifiers: Data Elements 1,3,4,10**

1. Medical Record Number
3. Date of Surgery: mm/dd/yyyy
4. Date of Birth: mm/dd/yyyy
10. Date of Death: mm/dd/yyyy



## **2. Isolated CABG**

Answer 'No' if any of the procedures listed in section A was performed concurrently with coronary artery bypass graft surgery.

It is not possible to list all procedures because cases can be complex and clinical definitions are not always precise. Only cardiac procedures have been listed. When in doubt, consult CCORP.

## **2. Isolated CABG**

### Section A

- Valve repairs or replacements
- Operations on structures adjacent to heart valves (papillary muscle, chordae tendineae, trabeculae carneae cordis, annuloplasty, infundibulectomy)
- Ventriculectomy
- Repair of atrial and ventricular septa, excluding closure of patent foramen ovale
- Excision of aneurysm of heart

## **2. Isolated CABG**

- Head and neck, intracranial endarterectomy
- Other open heart surgeries, such as aortic arch repair, pulmonary endarterectomy
- Endarterectomy of aorta
- Thoracic endarterectomy (endarterectomy on an artery outside the heart)
- Heart transplantation
- Repair of certain congenital cardiac anomalies, excluding closure of patent foramen ovale (e.g., tetralogy of fallot, atrial septal defect (ASD), ventricular septal defect (VSD), valvular abnormality)

## **2. Isolated CABG**

- Implantation of cardiomyostimulation system  
*(Note: refers to cardiomyoplasty only, not other heart-assist systems such as pacemakers or internal cardiac defibrillators)*
- Any aortic aneurysm repair (abdominal or thoracic)
- Aorta-subclavian-carotid bypass
- Aorta-renal bypass
- Aorta-iliac-femoral bypass

## **2. Isolated CABG**

- Caval-pulmonary artery anastomosis
- Extracranial-intracranial (EC-IC) vascular bypass
- Coronary artery fistula
- Full surgical Maze procedures. Requires that the left atrium be opened to create the 'maze' with incisions. Does not include "mini" Maze procedures limited to pulmonary vein isolation and/or amputation of the left atrial appendage

## **2. Isolated CABG**

- Resection of a lobe or segment of the lung (e.g., lobectomy or segmental resection of lung). Does not include simple biopsy of lung nodule in which surrounding lung is not resected, biopsy of a thoracic lymph node, or excision or stapling of an emphysematous bleb.
- Mastectomy for breast cancer (not simple breast biopsy)
- Amputation of any extremity (e.g., foot or toe)

## **2. Isolated CABG**

- If a procedure listed in section B is performed concurrently with the coronary artery bypass surgery, the case will be considered an isolated CABG and the data element coded 'Yes', unless a procedure listed in section A is performed during the same surgery.

## **2. Isolated CABG**

### Section B

- Transmyocardial laser revascularization (TMR)
- Pericardiectomy and excision of lesions of heart
- Repair/restoration of the heart or pericardium  
(**NOTE:** Surgeries whose principal goal is full pericardial stripping for preoperatively identified constrictive pericarditis are non-isolated.)

## **2. Isolated CABG**

- Coronary endarterectomy
- Pacemakers
- Internal Cardiac Defibrillators (ICDs)
- Fem-fem cardiopulmonary bypass (a form of cardiopulmonary bypass that should not be confused with aortofemoral bypass surgery listed in section A)
- Thymectomy
- Thyroidectomy

## **2. Isolated CABG**

- Same surgery
- Significantly increases risk
  - Cardiac
  - Vascular
  - Non-cardiac

### **Data Elements 5-8**

- **Patient Age (5)** Patient age in years
- **Gender (6)** Patient gender at birth
- **Race (7)** Patient race or ethnicity as determined by patient or family
- **Date of Discharge (8)** If patient died in hospital, the discharge date is the date of death

### **9. Discharge Status**

- Patient status upon discharge from the hospitalization in which surgery occurred.
- Death: Patient expired after admission and before leaving the hospital.
- Deaths are counted for CCORP just as they are for STS, either 1) during the same hospitalization as the surgery, or 2) after discharge but within 30 days of the surgery
- CCORP links to DHS Vital Statistics death file to identify deaths within 30 days of surgery

## **11. Responsible Surgeon Name**

- Three separate fields:

Last Name / First Name / Middle Initial

- Responsible surgeon is the principal surgeon who performs the coronary artery bypass procedure. If a trainee performs this procedure, then the responsible surgeon is the physician responsible for supervising this procedure performed by the trainee. In situations in which the responsible surgeon cannot otherwise be determined, the responsible surgeon is the surgeon who bills for the coronary artery bypass procedure

## **12. Responsible Surgeon CA License Number**

California Physician License Number of responsible surgeon, assigned by the Medical Board of California of the Department of Consumer Affairs.

### **Risk Factors: General Points**

- Collect *pre-operative* data
- Pre-operative is defined by STS as everything prior to the induction of anesthesia.
- In general, confirm diagnoses, don't make them

### **13. Height**

- Height of the patient in centimeters, NOT inches
- Valid values: 20.0 - 251.0 cm



## **14. Weight**

- Weight of the patient in kilograms, NOT pounds
- Valid values: 10.0 - 250.0 kg

## **15. Diabetes**

- The patient has a history of diabetes, regardless of duration of disease or need for anti-diabetic agents. Includes on-admission or preoperative diagnosis. Does not include gestational diabetes.

**NOTE:** STS definition is very easy to meet

- Insulin dependent, oral medications (NIDDM), or diet controlled
- type I (juvenile/insulin dep.) or type II (adult onset)

## **16. Hypertension**

The patient has a diagnosis of hypertension, documented by one of the following:

- Documented history of hypertension diagnosed and treated with medication, diet and/or exercise.
- Blood pressure > 140 systolic or >90 diastolic on at least 2 occasions.
- Currently on antihypertensive medication.

## **17. Peripheral Vascular Disease**

The patient has a history at any time prior to surgery of Peripheral Vascular Disease, as indicated by claudication either with exertion or rest; amputation for arterial insufficiency; aorto-iliac occlusive disease reconstruction; peripheral vascular bypass surgery, angioplasty, or stent; documented abdominal aortic aneurism (AAA), AAA repair, or stent; positive non-invasive testing documented. Does not include procedures such as vein stripping, carotid disease, or procedures originating above the diaphragm.

**NOTE:** ≥ 50% stenosis of aorta, iliac, femoral, popliteal

## **18. Cerebrovascular Disease**

The patient has a history at any time prior to surgery of Cerebrovascular Disease, documented by any one of the following:

- Unresponsive coma > 24 hours
- Cerebro-vascular accident (CVA)  
(symptoms > 72 hours after onset)
- Reversible ischemic neurological deficit (RIND)  
(recovery within 72 hours of onset)
- Transient ischemic attack (TIA)  
(recovery within 24 hours of onset)
- Non-invasive carotid test with > 75% occlusion
- Or prior carotid surgery
- Does not include neurological disease processes such as metabolic and/or anoxic ischemic encephalopathy

## **19. Cerebrovascular Accident**

The patient has a history, at any time prior to surgery, of a central neurologic deficit persisting more than 72 hours. (i.e., extremity weakness or loss of motion, loss of consciousness, loss of speech, field cuts).

Chart documentation of a prior diagnosis of CVA or stroke is sufficient.

## 20. Cerebrovascular Accident Timing

Events occurring within two weeks of the surgical procedure are considered recent ( $\leq 2$  weeks); all other are considered remote ( $> 2$  weeks).

## 21. Chronic Lung Disease

Specify if the patient has chronic lung disease and the severity level according to the following classification:

- **No:** no chronic lung disease present.
- **Mild:** Forced expiratory volume in one second (FEV1) 60% to 75% of predicted, and/or chronic inhaled or oral bronchodilator therapy.
- **Moderate:** FEV1 50-59% of predicted, and/or chronic steroid therapy aimed at lung disease.
- **Severe:** FEV1  $< 50\%$  predicted, and/or room air partial pressure of oxygen ( $pO_2$ )  $< 60$  or room air partial pressure of carbon dioxide ( $pCO_2$ )  $> 50$ , or on home O<sub>2</sub>.

## **21. Chronic Lung Disease**

**NOTE:** Do not code merely on the basis of a heavy smoking history or being labeled “COPD” in the chart *without other documentation* - i.e., you need to confirm the diagnosis.

- Must be *chronic*
- Severity determined by PFTs or type of Rx

## **22. Immunosuppressive Treatment**

Patient has used any form of immunosuppressive therapy (i.e., systemic steroid therapy) within 30 days preceding the operative procedure. Does not include topical applications and inhalers or one time systemic therapy.

**NOTE:** Steroids or other immunosuppressives given as part of a surgical protocol, solely because the patient is undergoing CABG, do not count.

## 22. Immunosuppressive Treatment

Patients post organ transplant or with rheumatologic conditions may be on immunosuppressive therapy other than corticosteroids such as:

- Azathioprine (Imuran)
- Cyclophosphamide (Cytoxan)
- Methotrexate
- Cyclosporine (Gengraf, Neoral, Sandimmune)
- Tacrolimus (Prograf)
- Sirolimus (Rapamune)
- Mycophenolate mofetil - MMF (Cellcept)

## 23. Hepatic Failure

The patient has cirrhosis, or other liver disease **and** a bilirubin greater than 2 mg/dl **and** a serum albumin less than 3.5 grams/dl.

**NOTE:** must have both:

- A clinical history of cirrhosis, hepatic failure, acute hepatitis or shock liver, **AND**
- Lab test abnormalities

Lab test abnormality alone is not sufficient

- This is NOT an STS data element

## **24. Dialysis**

The patient is currently undergoing dialysis

## **25. Last Creatinine Level Pre-Op (mg/dl)**

- The most recent creatinine level prior to surgery
- A creatinine level should be collected on all patients for consistency, even if they have no prior history
- Creatinine level is an important predictor of patient outcome

## **26. Left Main Disease (% stenosis)**

Percentage of compromise of vessel diameter in any angiographic view.

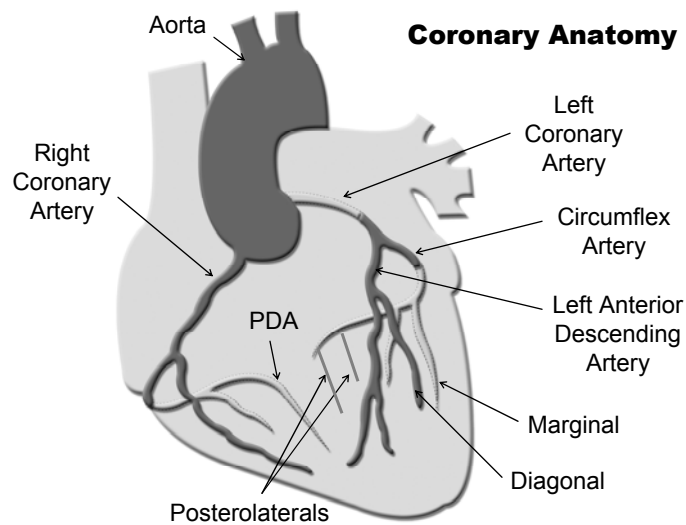
- CCORP collects actual % value
- STS collects as: LM  $\geq$  50% (yes/no)
- Described qualitatively:
  - Severe = 80%
  - Moderate = 35%
  - Mild = 20%
  - Borderline = 50%
  - Significant = 70%

## **26. Left Main Disease (% stenosis)**

- Terms such as plaquing or luminal irregularity should be considered mild.
- For ranges, report the mean as a whole number, for example, a 45-50% stenosis = 47% stenosis (per STS)

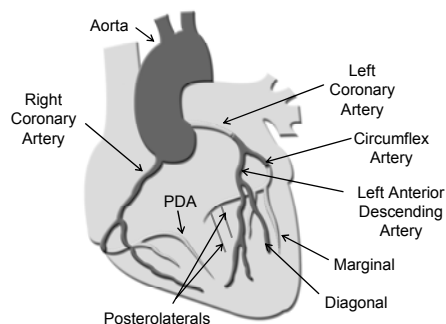


## 27. Number of Diseased Coronary Vessels



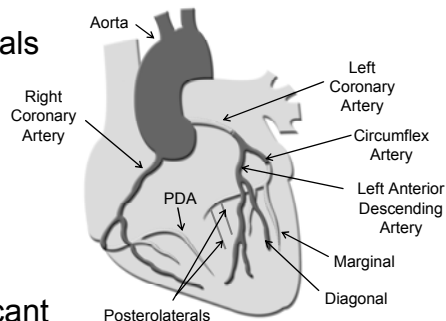
## 27. Number of Diseased Coronary Vessels

- The number of major coronary vessel systems (Left anterior descending (LAD) system, Circumflex system, and/or Right system) with  $\geq 50\%$  narrowing in any angiographic view.
- **NOTE:** Left main disease ( $\geq 50\%$ ) is counted as TWO vessels (LAD and Circumflex). For example, left main and right coronary artery (RCA) would count as three total.



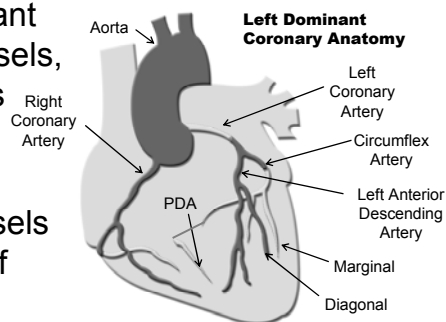
## 27. Number of Diseased Coronary Vessels

A “vessel system” is diseased if the vessel or its major branches have a  $\geq 50\%$  stenosis – e.g., left anterior descending artery (LAD) or its branches the diagonals; circumflex or its branches the marginals (also obtuse marginals or OM); right coronary artery (RCA) or its branch the post descending artery (PDA). Large posterolaterals may count as branches of the RCA or circumflex. Branches described as small or insignificant should not be counted.



## 27. Number of Diseased Coronary Vessels

- If left dominant anatomy, the circumflex feeds both circumflex and RCA territories and may count as two vessels if the stenosis jeopardizes both areas. Thus, a proximal stenosis in a dominant circumflex counts as two vessels, a distal stenosis or a stenosis in a branch (marginal or PDA) counts as one vessel.
- The number of diseased vessels may differ from the number of grafts placed.



## 28. Mitral Insufficiency

Whether there is evidence of mitral valve regurgitation.

- **None** = 0
- **Trivial** = 1+ (trace)
- **Mild** = 2+
- **Moderate** = 3+
- **Severe** = 4+

## 28. Mitral Insufficiency

- Use either ECHO or LV Gram
- Intraop TEEs cannot be used
- TEEs done before the induction of anesthesia should be used as a last resort
- If a range of MR is given, enter the higher value (e.g. for “2 to 3” enter “3”)

### **29. Ejection Fraction Done - New**

Indicate whether the Ejection Fraction was measured prior to the induction of anesthesia.

### **30. Ejection Fraction**

The percentage of blood emptied from the ventricle at the end of the contraction. Use the most recent determination prior to intervention.

### **30. Ejection Fraction**

- Values: 1-99
- Important predictor. Make every effort to obtain.
- For “30 to 35%”, enter “32” - no space for 32.5
- Described qualitatively:
  - 60% = Normal
  - 50% = Good
  - 45% = Mild
  - 40% = Fair
  - 30% = Moderate
  - 25% = Poor
  - 20% = Severe

### **30. Ejection Fraction**

- If mild to moderate, means 30 and 45 to get 37%.
- Low normal = 50%

### **31. Ejection Fraction Method**

Method of obtaining ejection fraction measurement information:

- **LV Gram:** Left Ventriculogram
- **Radionucleotide:** MUGA Scan
- **Estimate:** From other calculations, based upon available clinical data
- **ECHO:** Echocardiogram

### **31. Ejection Fraction Method**

- “Estimate” not based on ventricular imaging unacceptable
- Intraop TEEs cannot be used
- TEEs done before the induction of anesthesia should be used as a last resort

## **32. Myocardial Infarction**

Refers to any MI in the past.

For MIs prior to the current hospitalization for which detailed records are not available, chart documentation in which a clinician caring for the patient diagnosed an MI is sufficient.

For MIs during the current hospitalization, conditions *i* and *ii* below must be met:

## **32. Myocardial Infarction**

*i.* The patient must have been diagnosed with a MI (ST elevation or non ST elevation) by a clinician caring for the patient, AND

*ii.* At least 1 of the 3 following biochemical indicators:

- **Troponin T or I:** maximal concentration of troponin T or I exceeding the MI diagnostic limit (99th percentile of the values for a reference control group, as defined below) on at least one occasion during the first 24 hours after the index clinical event.

## **32. Myocardial Infarction**

- **CK-MB:** maximal value of CK-MB more than two times the upper limit of normal on at least one occasion during the first 24 hours after the index clinical event.

Maximal value of CK-MB preferable CK-MB mass, exceeding 99th percentile of the values of a reference control group, as defined below on two successive samples during the first 24 hours after the index clinical event.

## **32. Myocardial Infarction**

- **Total CK:** in the absence of availability of a troponin or CK-MB assay, total CK more than two times the upper limit of normal (99th percentile of the values for a reference control group, as defined below) or the B fraction of CK may be employed, but these two biomarkers are considerably less satisfactory than CK-MB.



## **32. Myocardial Infarction**

**Reference control values:** must be determined in each laboratory by studies using specific assays with appropriate quality control, as reported in peer-reviewed journals. Acceptable imprecision (coefficient of variation) at the 99th percentile for each assay should be defined as less than or equal to 10 percent. Each individual laboratory should confirm the range of reference values in their specific setting.

## **33. Myocardial Infarction Timing**

Time period between the last documented myocardial infarction and the CABG surgery in hours (Hrs) and days.

- < = 6 Hrs
- > 6 Hrs but < 24 Hrs
- 1 to 7 Days
- 8 to 21 Days
- > 21 Days

### **34. Arrhythmia**

Whether there is a history of preoperative arrhythmia (sustained ventricular tachycardia, ventricular fibrillation, atrial fibrillation, atrial flutter, third degree heart block) that has been clinically documented or treated with any of the following treatment modalities within two weeks prior to the CABG surgery:

- Ablation therapy
- AICD
- Pacemaker
- Pharmacological treatment
- Electrocardioversion

### **35. Arrhythmia Type**

The type of arrhythmia present within two weeks of the procedure is:

- Sustained Ventricular Tachycardia or Ventricular Fibrillation requiring cardioversion and/or intravenous amiodarone
- Third degree Heart Block
- Atrial Fibrillation/flutter requiring medication
- None

### **35. Arrhythmia Type**

- If more than one arrhythmia present, code with following priority: VT/VF then Afib/flutter, then heart block
- Within two weeks of surgery
- Sustained VT/VF is >30 seconds or requires electrical cardioversion
- NOT frequent PVCs (premature ventricular beats), bigeminy, or non-sustained ventricular tachycardia

### **36. Cardiogenic Shock**

The patient, at the time of procedure, is in a clinical state of hypoperfusion according to either of the following criteria:

- Systolic blood pressure (BP) <80 and/or Cardiac Index (CI) <1.8 despite maximal treatment.
- Intravenous inotropes and/or intra-aortic balloon pump (IABP) necessary to maintain Systolic BP >80 and/or CI >1.8

### **36. Cardiogenic Shock**

Patient either:

- **Currently** has SBP  $\leq$  80 mmHg and/or CI  $\leq$  1.8  
or
- **Previously** met these criteria but now is on inotropes or IABP

### **37. Angina**

The patient has ever had angina pectoris

### 38. Angina Type

The type of angina present within 24 hours prior to the CABG surgery is:

- **Stable:** Angina not meeting unstable criteria below that is controlled by oral or transcutaneous medication.
- **Unstable:** Requires continuous hospitalization from the episode until surgery and one of the following:
  - Angina at rest
  - New onset angina in past 2 months of at least Canadian Cardiovascular Society (CCS) Class III
  - Increasing angina in past 2 months – angina that has become more frequent, longer in duration, or lower in threshold; and increased by greater than or equal to one CCS Class to at least Class III severity

### 39. Congestive Heart Failure

Indicate whether, within two weeks prior to the initial surgical procedure, a physician has diagnosed that the patient is currently in congestive heart failure (CHF). CHF can be diagnosed based on careful history and physical exam, or by one of the following criteria:

- Paroxysmal nocturnal dyspnea (PND).
- Dyspnea on exertion (DOE) due to heart failure.
- Chest X-Ray (CXR) showing pulmonary congestion.
- Pedal edema or dyspnea and receiving diuretics or digoxin.

## **40. NYHA Classification**

New York Heart Association (NYHA) Classification represents the overall functional status of the patient in relationship to both congestive heart failure and angina.

Code the highest level leading to episode of hospitalization and/or procedure

**NOTE:** Symptoms due to angina or heart failure  
No symptoms = Class I

## **40. NYHA Classification**

**Class I** = Patients with cardiac disease but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.

#### **40. NYHA Classification**

**Class II** = Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitations, dyspnea or anginal pain.

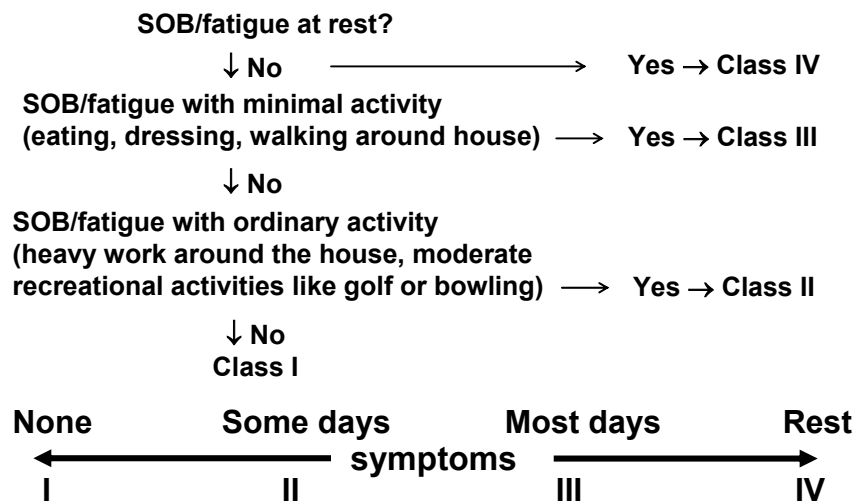
#### **40. NYHA Classification**

**Class III** = Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary physical activity results in fatigue, palpitations, dyspnea or anginal pain.

## 40. NYHA Classification

**Class IV** = Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of cardiac insufficiency or of the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased.

## 40. NYHA Classification





## **41. Resuscitation - New**

Indicate whether the patient required cardiopulmonary resuscitation within one hour before the start of the operative procedure

## **42. Incidence**

Whether this is the patient's:

- First cardiovascular surgery
- First re-op cardiovascular surgery
- Second re-op cardiovascular surgery
- Third re-op cardiovascular surgery
- Fourth or more re-op cardiovascular surgery

**NOTE:** Incidence replaced “Number of prior cardiac operations with cardiopulmonary bypass” and “No. of prior cardiac operations without cardiopulmonary bypass” in CCORP v.1.2

## **42. Incidence**

- Cardiovascular surgeries include CABG, valve replacement/ repair, intracardiac repairs (ASD, VSD), ventricular aneurysmectomy, or surgery on the aortic arch. Use of cardiopulmonary bypass (heart-lung machine) is not required.
- CV surgeries do **NOT** include PCIs, percutaneous valves, percutaneous aortic stent grafts, and non-cardiac vascular surgeries such as abdominal aortic aneurysm repairs or fem-pop bypasses, or pacemaker/ICD implantations.

## **42. Incidence**

- First cardiovascular surgery (first CV surgery)
- First re-op cardiovascular surgery (second CV surgery)
- Second re-op cardiovascular surgery (third CV surgery)
- Third re-op cardiovascular surgery (fourth CV surgery)
- Fourth or more re-op cardiovascular surgery (fifth + CV surgery)

### **43. Previous CABG - NEW**

Indicate whether the patient had coronary artery bypass graft surgery prior to the current admission.

### **44. Prior PCI**

Indicate whether a previous Percutaneous Coronary Intervention (PCI) was performed any time prior to this surgical procedure. PCI refers to those treatment procedures that unblock narrowed coronary arteries without performing surgery. PCI may include, but is not limited to:

- Balloon Catheter Angioplasty, Percutaneous Transluminal Coronary Angioplasty (PTCA)
- Rotational Atherectomy
- Directional Atherectomy
- Extraction Atherectomy
- Laser Atherectomy
- Intracoronary Stent Placement

## **45. PCI Interval**

The interval of time between the previous PCI and the current surgical procedure:

- <= 6 Hours
- > 6 Hours

## **46. Status of the Procedure**

The category that best describes the clinical status of the patient at the time of surgery

- Emergent/**Salvage**
- Emergent
- Urgent
- Elective

## **46. Status of the Procedure**

**Salvage:** The patient is undergoing cardiopulmonary resuscitation en route to the operating room or prior to anesthesia induction.

- Undergoing “Cardiopulmonary resuscitation” is interpreted as including patients who are undergoing chest compressions on the way to the operating room in addition to patients who are placed on cardio-pulmonary bypass (heart-lung machine) prior to being transported to the OR.
- For example, a patient who becomes pulseless but is successfully resuscitated in the cath lab by being placed on cardiopulmonary bypass would be considered emergent salvage.

## **46. Status of the Procedure**

**Emergent:** The patient’s clinical status includes any of the following:

- Ischemic dysfunction (any of the following)
  - Ongoing ischemia including rest angina despite maximal medical therapy (medical and/or intra-aortic balloon pump (IABP);
  - Acute evolving Myocardial Infarction within 24 hours before surgery; or
  - Pulmonary edema requiring intubation.
- Mechanical dysfunction (either or the following):
  - Shock with circulatory support; or
  - Shock without circulatory support.

## **46. Status of the Procedure**

**Urgent:** ALL of the following conditions are met:

- Not elective status
- Not emergent status
- Procedure required during same hospitalization in order to minimize change of further clinical deterioration
- Worsening, sudden chest pain; congestive heart failure (CHF); acute myocardial infarction (AMI); coronary anatomy; IABP; unstable angina (USA) with intravenous nitroglycerin; rest angina; valve dysfunction; or aortic dissection

## **46. Status of the Procedure**

**NOTE:** If the catheterization was elective, the status is usually elective, even if the patient was admitted for surgery after cath unless 1) clinical decompensation meeting definition of urgent (eg, unstable angina) or 2) left main  $\geq 80\%$ .

## 46. Status of the Procedure

**Elective:** The patient's status has been stable in the days or weeks prior to the operation. The procedure could be deferred without increased risk of compromised cardiac outcome.

## 46. Status of the Procedure

Refers to patient's pre-operative condition (immediately before surgery)

- Does not measure operative risk but rather how expediently surgery must be performed
- Salvage is a rare event
- Rule of thumb
  - **Salvage** - no pulse on way to OR
  - **Emergent** - **NOT** safe to wait
  - **Urgent** - safe to wait *in hospital*
  - **Elective** - safe to wait *at home*

## 47. CPB Utilization

Indicate the level of CPB or coronary perfusion used during the procedure

- **None:** no CPB or coronary perfusion during the procedure
- **Combination:** either a, b or c has to occur:
  - At start of procedure: No CPB/No coronary perfusion; followed by CPB
  - At start of procedure: No CPB/No coronary perfusion; followed by coronary perfusion
  - At start of procedure: No CPB/No coronary perfusion; followed by coronary perfusion; then convert to CPB
- **Full:** CPB or coronary perfusion was used for the entire procedure.

## 47. CPB Utilization

- **NOTE:** Coronary perfusion methods are used as an alternative to complete heart and lung bypass. They are often referred to perfusion assisted devices where just the coronary artery that is being grafted is perfused (distal) to the anastomoses site (a method of supplying distal perfusion to isolated coronary arteries while new grafts are constructed). While not as invasive as cardiopulmonary bypass it is still a method of supporting the myocardium during a period of relative ischemia. These devices allow for continued myocardial perfusion to the area of myocardium that is being revascularized, therefore reducing any ischemic time to that region.



## **48. CPB Utilization - Combination**

Whether the combination procedure was a planned or an unplanned conversion

- **Planned:** the surgeon intended to treat with any of the combination options described in “CPB utilization”
- **Unplanned:** the surgeon did not intend to treat with any of the combination options described in “CPB utilization”

**NOTE:** Replaced “Conversion to CPB” in CCORP v1.2

## **49. Cardioplegia**

Was Cardioplegia used.

## **50. Internal Mammary Artery/Arteries Used as Grafts**

Internal Mammary Artery(ies) (IMA) used for grafts,  
if any:

- Left IMA
- Right IMA
- Both IMAs
- No IMA

**NOTE:** Includes free graft (detached) IMAs.

## **51. Radial Artery Used - New**

Indicate which radial artery(ies) was/were used for grafts

- No radial artery
- Left radial artery
- Right radial artery
- Both radial arteries

## **CABG Surgery Morbidity (Complications)**

### **52. Reop - Bleed Tamponade - NEW**

Whether an operative re-intervention was required for bleeding/tamponade.

**NOTE:** Requires reopening the chest for bleeding.

### **53. Reop - Graft Occlusion - NEW**

Whether an operative re-intervention was required for coronary graft occlusion.

**NOTE:** Does not include post-op PCIs. Requires reopening of the chest to revise a graft.

### **54. Deep Sternal Wound Infection - NEW**

Indicate whether the patient had a deep sternal infection involving muscle, bone, and/or mediastinum requiring operative intervention that met ALL the following conditions:

- Wound was opened with excision of tissue (I&D) or re-exploration of mediastinum
- Positive culture
- Treatment with antibiotics

### **55. Postoperative Stroke >72 hours - NEW**

A central neurologic deficit persisting postoperatively for more than 72 hours.

### **56. Continuous Coma $\geq$ 24 hours - NEW**

A new postoperative coma that persists for at least 24 hours secondary to anoxic/ischemic and/or metabolic encephalopathy, thromboembolic event or cerebral bleed.

**NOTE:** Does not include medication induced coma.

### **57. Prolonged Ventilation - NEW**

Pulmonary insufficiency requiring a ventilator. Include (but not limited to) causes such as ARDS and pulmonary edema; also include any patient requiring mechanical ventilation for more than 24 hours postoperatively.

**NOTE:** Postoperative period begins when patient leaves the O.R.

### **58. Postoperative Renal Failure - NEW**

Acute or worsening renal failure resulting in one or more of the following:

- Increase of serum creatinine to  $> 2.0$  and 2x most recent preoperative creatinine level
- A new requirement of dialysis postoperatively

## **Patient Vignettes**

### **Vignette #1**

An otherwise healthy 65 year-old male presented to the emergency room with 30 minutes of chest pain at rest and ST segment depression on electrocardiogram. Chest pain and ECG changes resolved after a single sublingual nitroglycerin. He was admitted to a telemetry bed, treated with topical nitroglycerin, aspirin, IV heparin, and integrilin. He ruled out for myocardial infarction by serial enzymes. On the second hospital day, the IV heparin and integrilin were turned off and coronary angiography revealed a normal ejection fraction and a 60% stenosis of the left main, an 80% stenosis of the mid LAD, plaquing of the circumflex, and a 70% stenosis of the right coronary artery. He remained on the telemetry unit where he was free of recurrent chest pain or ECG changes on IV heparin and topical nitroglycerin. On the fourth hospital day he underwent bypass surgery. How would you code this patient?

### **Vignette #1**

- a) **Status?** Elective Urgent Emergent  
Emergent/Salvage
- b) **Angina?** Yes No
- c) **Angina type?** Unstable Stable
- d) **NYHA class?** I II III IV
- e) **Number of diseased vessels?** None One Two Three
- f) **Left main disease?** \_\_\_\_\_%

### **Vignette #4**

A 55 year-old female presented to her physician with 2 months intermittent exertional chest pressure without rest pain which was not progressive. After a positive stress test on which the patient exercised for 8 minutes, the patient was referred for catheterization which revealed a normal ejection fraction and an 70% stenosis of left main coronary artery and a 70% stenosis of the right coronary artery. She was admitted directly after the catheterization and remained symptom free at rest on aspirin and topical nitroglycerin. She underwent CABG two days later. Postoperatively she developed erythema of the sternal wound which was treated with antibiotics. How would you code this patient?



### **Vignette #4**

- a) **Status?**     Elective     Urgent     Emergent  
Emergent/Salvage
- b) **Angina?**     Yes     No
- c) **Angina type?**     Unstable     Stable
- d) **NYHA class?**     I     II     III     IV
- e) **Number of diseased vessels?** None   One   Two  
Three
- f) **Deep sternal wound infection?** Yes   No

### **Vignette #6**

A 73 year-old female with a history of coronary artery disease presented to the emergency room with 45 minutes of chest pain at rest. The electrocardiogram revealed ST segment depression on consistent with ischemia. Chest pain and ECG ischemic changes resolved with sublingual nitroglycerin and IV heparin. The patient was admitted and ruled in for a small myocardial infarction. Cardiac catheterization two days later revealed an ejection fraction of 45%, normal cardiac hemodynamics and three vessel disease including a 99% diagonal lesion, which was felt to be the lesion responsible for the patient's infarct. While still in the hospital the day following the catheterization, the patient had recurrent chest pain at rest that was relieved but then recurred after each of three sublingual nitroglycerins. She was started on IV nitroglycerin but the chest pain associated with ischemic ECG changes continued to come and go every few minutes despite increasing doses of nitroglycerin. Blood pressure remained stable and there were no signs of heart failure. The patient was taken to bypass surgery that afternoon. How would you code this patient?

## **Vignette #6**

- a) **Status?** Elective    Urgent    Emergent  
Emergent/Salvage
- b) **Angina?** Yes    No
- c) **Angina type?** Unstable    Stable
- d) **NYHA class?** I    II    III    IV
- e) **MI?**    Yes    No
- f) **MI when?**    <=6 hr    >6hrs <24 hrs    1-7days  
8-21days    >21days

## **Vignette #13**

A 56 year old female with a history of diabetes and hypertension undergoes elective CABG for progressive class II angina and three vessel disease with a normal ejection fraction. Her medical record reports an episode of "congestive heart failure" 2 years ago requiring a brief admission for IV diuretics. At the time of her surgery, however, she has not recently had symptoms of heart failure or had exam or X-ray findings of heart failure (i.e. rales or chest X-ray with cardiomegaly or interstitial edema). On the second post operative day she becomes hypotensive and goes back to the operating room for control of bleeding and evacuation of a hemopericardium. How would you code this patient?

### **Vignette #13**

- a) **Congestive heart failure?**    Yes    No
- b) **NYHA Class?**    I        II        III        IV
- c) **Reop Bleed / Tamponade**    Yes        No

### **Vignette #16**

A 56 year old female with a history of diabetes and hypertension undergoes elective CABG for three vessel disease with a normal ejection fraction. Chest X-ray on admission reveals pulmonary venous congestion. She has a history of congestive heart failure requiring admission to the hospital most recently 3 months ago. She is being treated with daily lasix and an ACE inhibitor. She currently has dyspnea with walking less than 1 block on flat surfaces or walking up 1 flight of stairs, ankle edema, and 2 pillow orthopnea. How would you code this patient?

### **Vignette #16**

- a) **Congestive heart failure?**    Yes    No
- b) **NYHA Class?**    I        II        III        IV

### **Vignette #20**

A 66 year-old male undergoes elective CABG for progressive angina and three vessel disease with a depressed ejection fraction. Six months earlier, he had an implantable cardiac defibrillator placed for an episode of ventricular tachycardia associated with syncope and requiring electrical cardioversion. Postoperatively, he remained comatose for two days before gradually becoming more responsive. How would you code this patient?

### **Vignette #20**

- a) **Arrhythmia?**      Yes   No
- b) **Arrhythmia type?**   Sustained VT/VF  
Heart Block   Afib/Aflutter   None
- c) **Cont Coma  $\geq$ 24 hrs?**    Yes   No

### **Vignette #21**

A 69 year-old male underwent elective CABG for progressive angina and three vessel disease. The admitting history mentions a history of “chronic obstructive pulmonary disease” (COPD) and a history of heavy tobacco use. However, the patient was not on metered dose inhalers, steroids, theophylline, or other pharmacotherapy for COPD and there is no documentation of FEV1. How would you code this patient?

- a) **COPD?**      No    Mild   Moderate   Severe

### **Vignette #27**

A 60 year-old female underwent CABG for angina poorly controlled on medical therapy. The admitting history and physical states the patient is on atrovent inhalers and prednisone for the treatment of "chronic bronchitis." There is no documented FEV1. How would you code this patient?

- a) **Chronic Lung disease?** No Mild Moderate Severe
- b) **Immunosuppressive treatment?** Yes No

### **Vignette #33**

A 56 year-old female with diabetes and hypertension undergoes elective CABG for three vessel disease with a normal ejection fraction. She is being treated with daily lasix and enalapril for "congestive heart failure." She currently has dyspnea with walking 1 to 2 blocks or up 1 flight of stairs, orthopnea, and a chest X-ray which is read as "cardiomegaly and mild pulmonary venous congestion". How would you code this patient?

- a) **Congestive heart failure?** Yes No
- b) **NYHA Class?** I II III IV

### **Vignette #43**

A 73 year old female is admitted to the hospital for unstable angina. She has a history of a PTCA 3 years ago and CABG surgery 2 years ago in 1994. She is found to have an occluded bypass graft to the LAD and a tight stenosis of the proximal native LAD. She is taken for angioplasty (PTCA) of the native LAD but in attempting to pass the guide wire a dissection is caused with threatened closure and the PTCA is aborted. She is taken directly from the cath lab to the operating room for CABG within 2 hrs. How would you code this patient?

### **Vignette #43**

- a) **Previous CAB?** Yes No
- b) **Incidence?** 1st CV surgery 1st reop CV surg  
2nd reop 3rd reop 4th reop
- c) **Prior PCI?** Yes No
- d) **PCI to surgery interval?** <6hrs >6hrs
- e) **Status?** Elective Urgent Emergent  
Emergent/Salvage

### **Vignette #46**

An 71 year female undergoes CABG. She has a history of mitral valve replacement 20 years earlier for rheumatic heart disease. How would you code this patient?

- a) **Previous CAB?** Yes No
- b) **Incidence?** 1st CV surgery 1st reop CV surg  
2nd reop 3rd reop 4th reop

### **For Data Element Questions and Review**

- Visit the Cardiologist's Q&A Section at the CCORP website (Data Elements Definition) at:  
<http://www.oshpd.ca.gov/HQAD/Outcomes/CCORP/index.htm>
- Email your question(s) to Denise King, Data Manager at:  
[dking@oshpd.state.ca.us](mailto:dking@oshpd.state.ca.us)